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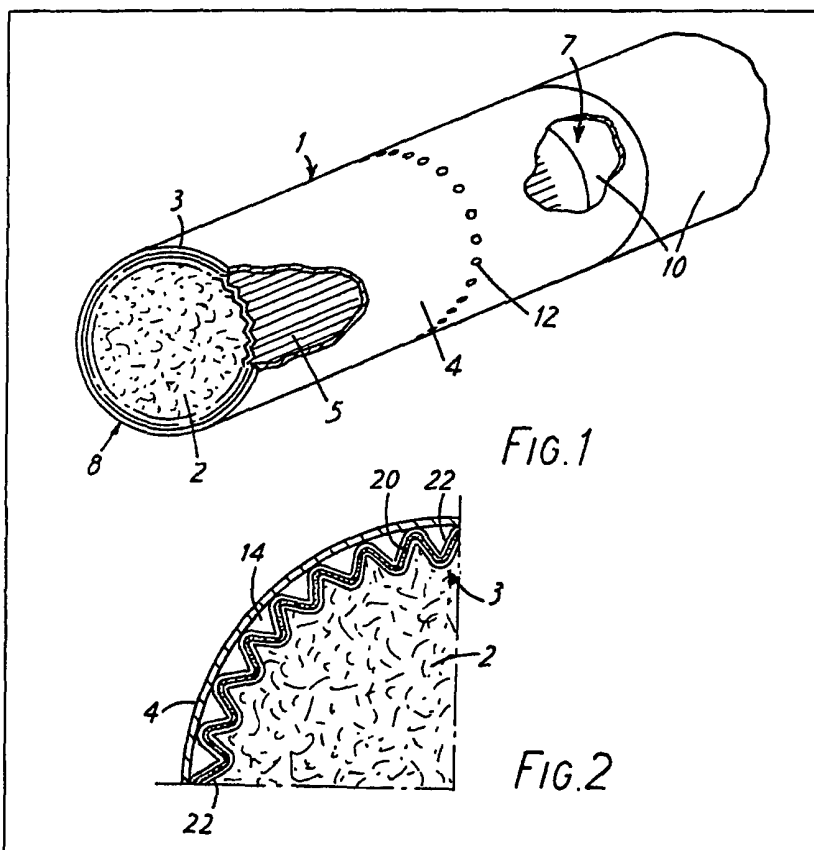
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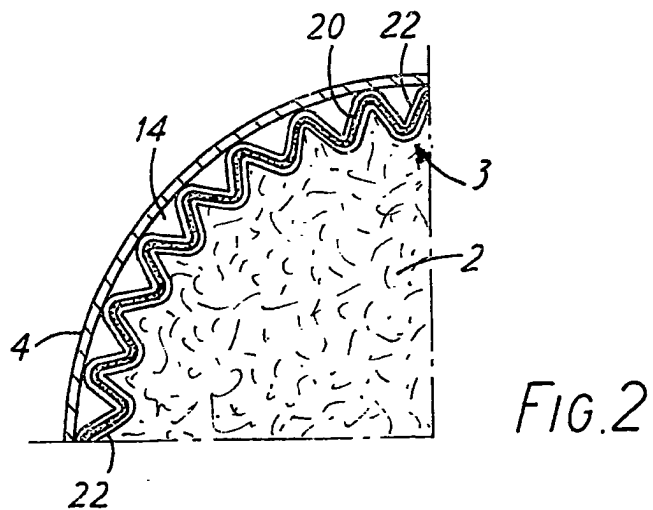
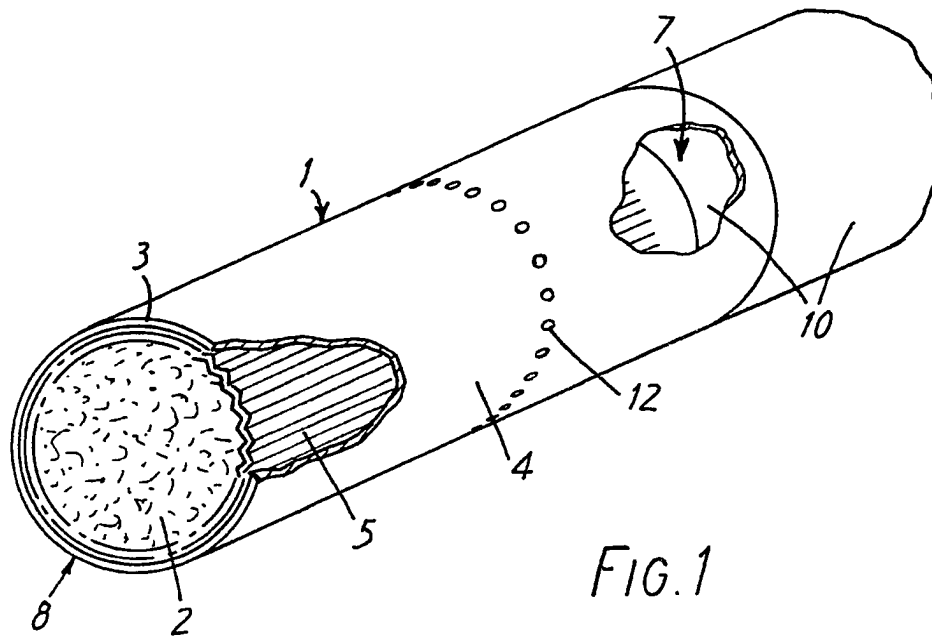
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(54) Wrapped filter

(57) A tobacco smoke filter comprising an axially elongate filtering core (2) and secured around the core a plugwrap (3) of a paper (22)/synthetic thermoplastics (20)/paper (22) laminate. The plugwrap may be embossed with longitudinal corrugations (5) with the surface of the core conforming thereto. The synthetic thermoplastics material is suitably a polyolefin such as polyethylene.



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SPECIFICATION

Wrapp d filter

- 5 The present invention relates to tobacco smoke filters and resides in the use as a filter rod plugwrap of a paper/synthetic thermoplastics/paper laminate. The invention thus provides a tobacco smoke filter comprising an
- 10 axially elongate filtering core and secured around the core a plugwrap of the said laminate.

The synthetic thermoplastics material of the laminate is suitably a polyolefin, preferably

15 polyethylene.

- The plugwrap material employed according to the invention has a particularly advantageous combination of desirable properties in that it is readily secured in position by means of a
- 20 lapped and stuck seam; is inherently highly air- and smoke-impermeable; and has good permanent embossing characteristics with retention of this impermeability. Prior plugwrap materials have exhibited at most two of these properties. The plugwrap employed according to the invention is thus particularly advantageous for use in the production of filter rods having peripheral longitudinal passages; the
- 25 plugwrap can be pre-embossed to the required configuration — e.g. with longitudinally extending grooves or corrugations which may be continuous or spaced apart by regions (e.g. unembossed or embossed with lateral corrugations) where the longitudinal grooves or corrugations terminate — and then
- 30 wrapped around an axially elongate filtering core member and secured by means of a lapped and stuck seam. The embossed plugwrap thus provides the required external impermeable grooves. In some cases, e.g.
- 35 where the embossed plugwrap is applied around a filtering core of plasticised cellulose acetate filaments or fibres when the latter is not fully cured and hardened, the profile of the embossed plugwrap may impress itself into the filtering core so that the two conform substantially completely to one another. In other cases, when the core at the time of
- 40 enwrapment is harder, there may be little or no such conformation of the core periphery to the wrapper profile, so that internal channels will also be left defined between core and wrapper. Other embossed conformations for the plugwrap laminate are possible; for example it may be embossed with circumferentially
- 45 spaced, longitudinally overlapping grooves of finite lengths, or the grooves or corrugations may be replaced by dimpled regions — to provide in effect externally of the wrapped core an array of interconnecting passages or channels.

The various embossed configurations for the plugwrap laminate are readily achieved by passing the plain plugwrap between heated

50 co-operating embossing rolls of the required

surface configuration, preheating of the plain plugwrap to soften the thermoplastics layer sometimes being advantageous.

- Filter rods employing the embossed laminate plugwrap according to the invention can be provided with an outer wrapper in surrounding engagement about the embossed plugwrap; this outer wrapper may be applied continuously as part of the filter production
- 70 process immediately after application of the embossed laminate plugwrap, or it may be the tipping overwrap which is employed to secure the individual filter element to a wrapped tobacco rod in the production of a filtered
- 75 cigarette; in either case the outer wrapper may be of inherently air-permeable material and/or perforated to provide for the passage of external air through the outer wrapper into the external grooves or passages provided by
- 80 the embossed plugwrap.

The laminate plugwrap can however also be used in its plain, unembossed condition; and, whether plain or embossed, it can for particular purposes and filter constructions be provided with perforations either uniformly or in restricted localities. Whether the laminate plugwrap is perforate or imperforate, plain or embossed, the filtering core around which it is wrapped may be or any of a whole range of materials and structures. It may itself be a

85 wrapped body or unwrapped; the filtering material of the core may comprise bonded or unbonded filaments or staple fibres, e.g. of cellulose acetate, gathered creped paper, etc; the core may comprise a composite of abutting or longitudinally spaced plugs of the same or different materials; the core may incorporate particulate additives uniformly dispersed therethrough or localised in spaced pockets or

90 inter-plug spaces; the core may have a profiled (e.g. longitudinally grooved) periphery, and it may have internal passages or cavities which may be filled or unfilled; the laminate plugwrap may surround a cavity or recess open at an end of the filter and in a filter cigarette such a recess or cavity may be against the tobacco rod or exposed at the buccal end.

One type of laminate suitable for use according to the invention is formed by extruding a web of the synthetic thermoplastics material and supplying webs of paper to either face of the extrudate and bonding them thereto whilst the synthetic thermoplastics material is still tacky. One suitable laminate obtained in this way has a central layer of polyethylene weighing 10 g/m² with facing layers of machine glazed paper each 25 g/m². Another type of laminate suitable for use in the invention has the synthetic thermoplastics layer bonded by adhesive to the facing paper; on such laminate again has a 10 g/m² polyethylene layer with creped paper bonded by adhesive to each face, one of the paper layers being of 25 g/m² and the other

100 of 35 g/m². Whilst the laminate employed

according to the invention usually consists of a single synthetic thermoplastics layer with a single paper layer on either face, the laminate could incorporate additional layers between the facing paper layers.

A filter according to the invention is illustrated in perspective view in Fig. 1 of the accompanying drawings, this filter having a core 2 of bonded plasticised cellulose acetate filamentary tow wrapped in a smoke-impermeable plugwrap 3. The latter consists of a 10 g/m² layer of low density polyethylene extrusion laminated to respective facing layers of 25 g/m² machine glazed paper, and is embossed with longitudinally extending corrugations 5 which extend from one end of the filter to terminate at a plain, unembossed region 6 at the other end of the filter. The corrugations 5 of plugwrap 3 impress themselves into the surface of core 2 so that core and plugwrap conform to one another. The filter is shown secured to a wrapped tobacco rod 10 by means of tipping overwrap 4 which has ventilation perforations 12 in register with the channels 14 which are defined between the corrugations 5 and tipping overwrap 4, these channels 14 being open at the buccal end 8 of the filter and terminating short of the tobacco rod end 7 where they meet the plain plugwrap portion 6.

Fig. 2 of the accompanying drawings, which is a fragmentary view of the buccal end of the Fig. 1 filter, shows more clearly the structure of plugwrap 3 with its polyethylene layer 20 and two facing paper layers 22.

Normally the filters according to the invention will be formed as a continuous rod which is then continuously cut transversely into finite lengths. A wrap may if desired be applied continuously around the continuous rod before the cutting into finite lengths. For filter cigarette manufacture, a double length such product is disposed with a wrapped tobacco rod abutting either end, tipping overwrap is applied to join the tobacco rods and intervening filter rod together, and the resulting combination is cut in half to produce two filter cigarettes. The initially produced continuous filter is normally cut into even multiple (e.g. sextuple) length units for supply to the filter cigarette manufacturer who then cuts these multiple lengths into double lengths for use in filter cigarette production as described above.

55 CLAIMS

1. A tobacco smoke filter comprising an axially elongate filtering core and secured around the core a plugwrap of a paper/synthetic thermoplastics/paper laminate.
2. A filter according to claim 1 wherein the synthetic thermoplastics comprises polyolefin.
3. A filter according to claim 2 wherein the synthetic thermoplastics comprises polyethylene.

4. A filter according to any preceding claim wherein the periphery of the core conforms to the inner surface of the plugwrap.

5. A filter according to any preceding claim wherein the plugwrap is perforate.

6. A filter according to any preceding claim wherein the plugwrap provides peripheral longitudinal passages over at least part of its length.

7. A filter according to claim 6 wherein the plugwrap has longitudinal grooves or corrugations over at least part of its length.

8. A filter according to claim 6 or 7 having an outer wrap of tipping material providing for the passage of external air laterally therethrough into said passages.

9. A filter according to claim 8 wherein said tipping material comprises tipping overwrap incorporating said filter in a filter cigarette.

10. A tobacco smoke filter substantially as hereinbefore described with reference to the accompanying drawings.

11. A filtered cigarette substantially as hereinbefore described with reference to the accompanying drawings.

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